1) Aproximación Bessel

$$T(jw) = |T| \cdot e^{j\angle T} = 1 \cdot e^{-jw t_0} = e^{-jw/(1/t_0)} = e^{-jw} \Big]_{w=\frac{s}{1}} = e^{-s}$$

$\Omega w = 1$

$$T(s) = e^{-s} = \frac{1}{\operatorname{senh}(s) + \cosh(s)} = \frac{1/\operatorname{senh}(s)}{1 + \operatorname{cotgh}(s)} \Rightarrow \operatorname{cotgh}(s) = \frac{\cosh(s)}{\operatorname{senh}(s)} //$$

$$\left.\begin{aligned} \cosh(s) &= 1 + \frac{s^2}{2!} + \frac{s^4}{4!} + \frac{s^6}{6!} + \dots \\ \operatorname{senh}(s) &= s + \frac{s^3}{3!} + \frac{s^5}{5!} + \frac{s^7}{7!} + \dots \end{aligned}\right\} \operatorname{cotgh}(s) = \frac{1}{s} + \cfrac{1}{\frac{3}{s} + \cfrac{1}{\frac{5}{s} + \cfrac{1}{\frac{7}{s} + \dots}}}$$

Método de storch: $T(s) = \dfrac{B_n(0)}{B_n(s)}$

Para n=2

$$\operatorname{cotgh}(s) = \frac{1}{s} + \frac{s}{3} = \frac{3+s^2}{3s} \Rightarrow B_2(s) = s^2 + 3s + 3 //$$

$$T_2(s) = \frac{B_2(0)}{B_2(s)} \Rightarrow \boxed{T_2(s) = \frac{3}{s^2+3s+3}}$$

Para n=3

$$\operatorname{cotgh}(s) = \frac{1}{s} + \cfrac{1}{\frac{3}{s} + \frac{s}{5}} = \frac{6s^2+15}{s^3+15s} \Rightarrow B_3(s) = s^3 + 6s^2 + 15s + 15 //$$

$$T_3(s) = \frac{B_3(0)}{B_3(s)} \Rightarrow \boxed{T_3(s) = \frac{15}{s^3+6s^2+15s+15}}$$

Para n=4

$$\operatorname{cotgh}(s) = \frac{1}{s} + \cfrac{1}{\frac{3}{s} + \cfrac{1}{\frac{5}{s} + \frac{s}{7}}} = \frac{s^4+45s^2+105}{10s^3+105s} \Rightarrow B_4(s) = s^4 + 10s^3 + 45s^2 + 105s + 105$$

$$T_4(s) = \frac{B_4(0)}{B_4(s)} \Rightarrow \boxed{T_4(s) = \frac{105}{s^4+10s^3+45s^2+105s+105}}$$